

Amendments to the Claims:

The listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

5

Claim 1 (Currently Amended): A signal processing device for processing a received signal to generate a sliced signal, comprising:

an equalizer for generating an equalized signal according to the received signal;

10

a multilevel quantizer, coupled to the equalizer, for utilizing X

threshold/thresholds to quantize the equalized signal to thereby output the

sliced signal being one of at least X+1 predetermined levels when a first

mode is adopted, and utilizing Y thresholds to quantize the equalized signal

to thereby output the sliced signal being one of at least Y+1 predetermined

15

levels when a second mode is adopted, wherein the X and the Y are positive

integers, the Y is more than the X, and the at least Y+1 predetermined levels

are more than the at least X+1 predetermined levels; and

a control logic for adopting one of the first mode and the second mode by

executing the following steps:

20

adopting the first mode and then comparing the equalized signal with the

sliced signal which is the one of the at least X+1 predetermined levels for

obtaining a first difference and comparing the equalized signal with a

predetermined value which is different from any of the sliced signal and

the X threshold/thresholds for obtaining a second difference;

25

adopting the second mode instead of the first mode when the first difference

and the second difference together indicate an unreliable status; and

adopting the first mode when the first difference and the second difference

together indicate a reliable status.

~~a multilevel quantizer coupled with the equalizer for selectively utilizing a first~~

30

~~amount of one or more thresholds or a second amount of one or more~~

~~thresholds to quantize the equalized signal in order to generate the sliced
signal, wherein the first amount is different from the second amount; and
a control logic for controlling the multilevel quantizer to quantize the
equalized signal by the first amount of threshold/thresholds or the second
amount of threshold/thresholds;~~

~~wherein the control logic controls the multilevel quantizer by executing the
following steps:~~

~~comparing the equalized signal with a predetermined level for a first
difference;~~

~~comparing the equalized signal with a predetermined constant for a second
difference;~~

~~controlling the multilevel quantizer to quantize the equalized signal by the
first amount of threshold/thresholds for the sliced signal, in the case of the
first difference and the second difference having the same sign
(positive/negative); and~~

~~controlling the multilevel quantizer to quantize the equalized signal by the
second amount of threshold/thresholds for the sliced signal, in the case of
the first difference and the second difference having different signs
(positive/negative).~~

Claim 2 (Previously Presented): The device of claim 1 wherein the equalizer
comprises a feed-forward equalizer (FFE), a feed-back equalizer (FBE), and an
adder coupled respectively with the FFE and the FBE for outputting the
equalized signal according to signals outputted from the FFE and the FBE.

Claim 3 (Previously Presented): The device of claim 1 further comprising:
a derotator coupled between the equalizer and the multilevel quantizer for
derotating the equalized signal and inputting the derotated equalized signal
into the multilevel quantizer; and
a rotator coupled between the multilevel quantizer and the equalizer for

rotating the sliced signal outputted from the multilevel quantizer and
inputting the rotated sliced signal into the equalizer.

5 Claim 4 (Previously Presented): The device of claim 3 wherein the rotator is coupled
with a feed-back equalizer of the equalizer for rotating the sliced signal, and
the rotated sliced signal is a passband signal.

Claims 5-7 (Cancelled)

10 Claim 8 (Currently Amended): The device of claim 1 wherein the predetermined value
~~constant is determined by~~ results from a constant modulus algorithm.

Claims 9-10 (Cancelled)

15 Claim 11 (Currently Amended): The device of claim 1 wherein a first number of
bit/bits of the sliced signal when the first mode is adopted is less than a second
number of bits of the sliced signal when the second mode is adopted ~~output by~~
~~the multilevel quantizer has a plurality of bits.~~

20 Claim 12 (Currently Amended): A signal processing device for generating a sliced
signal according to a received signal, comprising:
an equalizer for generating an equalized signal according to the received
signal;
25 a quantizer, coupled to the equalizer, for utilizing X threshold/thresholds to
quantize the equalized signal to thereby output the sliced signal being one of
at least X+1 predetermined levels when a first mode is adopted, and
utilizing Y thresholds to quantize the equalized signal to thereby output the
sliced signal being one of at least Y+1 predetermined levels when a second
mode is adopted, wherein the X and the Y are positive integers, the Y is

- more than the X, and the at least Y+1 predetermined levels are more than
the at least X+1 predetermined levels; and
a control logic for adopting one of the first mode and the second mode by
executing the following steps:
- 5 adopting the first mode and then comparing the equalized signal with the
 sliced signal which is the one of the at least X+1 predetermined levels for
 obtaining a first difference and comparing the first difference with a
 predetermined threshold which is different from any of the sliced signal
 and the X threshold/thresholds;
- 10 adopting the second mode instead of the first mode when the first difference
 is larger than the predetermined threshold; and
 adopting the first mode when the first difference is smaller than the
 predetermined threshold.
- ~~a quantizer, coupled to the equalizer, for generating the sliced signal according~~
15 ~~to the equalized signal and a first amount of threshold/thresholds when a~~
 ~~first slice mode is applied, and generating the sliced signal according to the~~
 ~~equalized signal and a second amount of threshold/thresholds when a second~~
 ~~slice mode is applied; and~~
- ~~a control logic, coupled to the quantizer, for controlling the quantizer to apply~~
20 ~~the first slice mode or the second slice mode through executing the following~~
 ~~steps:~~
- ~~subtracting the equalized signal from a predetermined level to obtain a first~~
 ~~value;~~
- ~~determining whether the quantizer is in a first status or a second status~~
25 ~~according to the first value;~~
- ~~if the quantizer is in the first status, controlling the quantizer to apply the~~
 ~~first slice mode; and~~
- ~~if the quantizer is in the second status, controlling the quantizer to apply~~
 ~~the second slice mode;~~
- 30 ~~wherein the first amount of threshold/thresholds is different from the second~~

~~amount of threshold/thresholds.~~

Claim 13 (Cancelled)

5 Claim 14 (Currently Amended): The signal processing device of claim 12, wherein the control logic obtains the first difference by ~~further executes the following~~ steps:

10 subtracting the equalized signal from the sliced signal which is the one of
 the at least X+1 predetermined levels ~~a predetermined constant to obtain a~~
 ~~second value; and~~
 ~~comparing the first value with the second value, so as to determine whether~~
 ~~the quantizer is in the first status or second status.~~

15 Claim 15 (Currently Amended): The signal processing device of claim 12 ~~[[14]]~~, wherein the control logic further executes the following steps: ~~compares the~~
~~first value with the second value, so as to determine whether the first and~~
~~second values have the same attribute and thereby determine that the quantizer~~
~~is in the first status or second status.~~

20 adopting the first mode and then comparing the equalized signal with a
 predetermined value which is different from any of the sliced signal and
 the X threshold/thresholds for obtaining a second difference; and
 adopting the second mode instead of the first mode when not only the first
 difference is larger than the predetermined threshold but also the first
 difference and the second difference together indicate an unreliable status.

25

Claim 16 (Cancelled)

Claim 17 (Currently Amended): A signal processing method for generating a sliced signal according to a received signal, comprising:

- 5 generating an equalized signal according to the received signal;
 utilizing X threshold/thresholds to quantize the equalized signal to thereby
 output the sliced signal being one of at least X+1 predetermined levels when
 a first mode is adopted;
 utilizing Y thresholds to quantize the equalized signal to thereby output the
10 sliced signal being one of at least Y+1 predetermined levels when a second
 mode is adopted, wherein the X and the Y are positive integers, the Y is
 more than the X, and the at least Y+1 predetermined levels are more than
 the at least X+1 predetermined levels;
 adopting the first mode and then subtracting the equalized signal from the
15 sliced signal which is the one of the at least X+1 predetermined levels for
 obtaining a first difference and comparing the first difference with a
 predetermined threshold which is different from any of the sliced signal and
 the X threshold/thresholds;
 adopting the second mode instead of the first mode when the first difference is
20 larger than the predetermined threshold; and
 adopting the first mode when the first difference is smaller than the
 predetermined threshold.
~~generating the sliced signal according to the equalized signal and a first-~~
~~amount of threshold/thresholds when a first slice mode is applied, and~~
25 ~~generating the sliced signal according to the equalized signal and a second-~~
~~amount of threshold/thresholds when a second slice mode is applied; and~~
~~applying one of the first slice mode and the second slice mode according to the~~
~~following steps:~~
~~subtracting the equalized signal from a predetermined level to obtain a first-~~
30 ~~value;~~

~~determining whether the sliced signal is substantially correct or substantially
incorrect according to the first value;
if the sliced signal is substantially correct, applying the first slice mode; and
if the sliced signal is substantially incorrect, applying the second slice
mode;~~
5 ~~mode;~~
~~wherein the first amount of threshold/thresholds is different from the second
amount of threshold/thresholds.~~

Claims 18-19 (Cancelled)

10

Claim 20 (Currently Amended): The method of claim 17 [[19]], further comprising:

adopting the first mode and then comparing the equalized signal with a
predetermined value which is different from any of the sliced signal and the
X threshold/thresholds for obtaining a second difference; and
15 adopting the second mode instead of the first mode when not only the first
difference is larger than the predetermined threshold but also the first
difference and the second difference together indicate an unreliable status.

~~comparing the first value with the second value, so as to determine whether the
first and second values have the same attribute and thereby determine that
the sliced signal is substantially correct or substantially incorrect.~~

20

Claims 21-24 (Cancelled)

Claim 25 (Currently Amended): The method of claim 17, further comprising:

25 generating the sliced signal with a first number of bit/bits when the first

[[slice]] mode is adopted ~~applied~~; and
generating the sliced signal with a second number of bits ~~bit/bits~~ which is
~~different from~~ more than the first number of bit/bits when the second [[slice]]
mode is adopted ~~applied~~.

5

Claim 26 (Cancelled)

Claim 27 (New): The device of claim 1, wherein the control logic further executes the
following steps:

10 adopting the first mode and then comparing the first difference with a
 predetermined threshold which is different from any of the sliced signal
 and the X threshold/thresholds; and
 adopting the second mode instead of the first mode when not only the first
 difference and the second difference together indicate the unreliable status
15 but also the first difference is larger than the predetermined threshold.

Claim 28 (New): The device of claim 27, wherein the control logic obtains the first
difference by subtracting the equalized signal from the sliced signal which is
the one of the at least X+1 predetermined levels.